

# FINAL REPORT ADDENDUM

Munitions Classification Library

ESTCP Project MR-201424

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## 1.0 INTRODUCTION

This is a summary report on additional data collected for MR-201424 after the final report was submitted. In addition to two new munitions items measured at Spring Valley, most of the data collected were on Blossom Point common munitions items that were previously obtained solely using the MPEDEMIS, an advanced TEM system which UX-Analyze does not support. Because part of the deliverable for MR-201424 were self-contained HDF5 data files that can be imported into UX-Analyze to create the single-solver and multi-solver library databases, and only the TEMTADS 2X2 and the MetalMapper advanced TEM systems are supported by UX-Analyze, data on those items were re-collected using the TEMTADS 2X2.

## 2.0 DATA COLLECTION

The equipment was setup in accordance with the procedures and guidelines outlined in section 3.1 of the SOP (Appendix C of MR-201424 FRv2). The acquisition parameters used for the TEMTADS 2X2 are shown in Table 4-4 of the same report.

### 2.1 BLOSSOM POINT

Data were collected with the TEMTADS 2X2 for 21 unique items over a period of 2 days, August 8 – 9, 2016. The collection took place indoors at the Blossom Point Army Research Laboratory facility.

#### 2.1.1 MEASURED ITEMS

The items measured at Blossom Point ranged in size from smaller submunitions to larger projectiles. The specifics of each of the items are tabulated in Table 2-1 below. Although the large ISO40 was one of the items slated for recollection, a large ISO80 was instead mistakenly measured during this recollection phase. A large ISO40 was collected a couple of weeks later at Spring Valley as described below.

Table 2-1 – The 21 items (from Table 4-1 of MR-201424 FRv2) that belong to the Blossom Point common munitions collection and that were measured initially solely by the MPEDEMIS and were recollected using the TEMTADS 2X2. A large ISO80 was mistakenly measured for the intended large ISO40.

Name	Mark/Mod	Class <sup>1</sup>	Fins	Fuse	Spotting Charge	Rotating Band	Condition <sup>2</sup>	Comments
20mm TP-T	M220	P	N	N	N	Y	F/W	NRL 52
60mm	M49A2	M	Y	Y	N	N	F/W	NRL60-1
75mm	Mk I shrapnel	P	N	N	N	Y	F/W	
75mm	Mk I shrapnel	P	N	N	N	N	F/W	
76mm HEAT	M496	M	Y	Y	N	N	U/P	
81mm	M374	M	N	N	N	N	U/P	
81mm	M43A1	M	Y	N	N	N	F/W	
105mm	M84	P	N	N	N	N	F/W	Smoke
105mm	M84	P	N	N	N	Y	F/W	Smoke
105mm	M314A3	P	N	Y	N	Y	F/W	Illumination; no base

Name	Mark/Mod	Class <sup>1</sup>	Fins	Fuse	Spotting Charge	Rotating Band	Condition <sup>2</sup>	Comments
155mm	M741	P	N	Y	N	Y	U/W	Dispensing
Rifle Grenade	M11A3	G	Y	Y	N	N	F/B	Practice, bent fins
Rifle Grenade	M31	G	Y	Y	N	N	F/B	Practice
Rockeye	MK118	S	Y	Y	N	N	U/P	Practice
25-lb	Mk76	B	Y	N	N	N	F/B	BDU-33 Practice Bomb
2.36-in	M7	R	Y	Y	N	N	F/W	Bazooka ; Partial fin; no nose cone
2.75-in	M151 HE	RWH	N	Y	N	N	U/P	
3-in	Stokes Mortar	P	N	Y	N	N	F/W	
4.2-in	M335A2	P	N	Y	N	Y	F/W	
Large ISO40		SO	N	N	N	N	Pristine	Large ISO80 measured by mistake
Medium ISO40		SO	N	N	N	N	Pristine	Rusty

## 2.2 SPRING VALLEY

Data were collected with the TEMTADS 2X2 over 3 unique items. This occurred over a period of 2 days on the 18<sup>th</sup> and 25<sup>th</sup> of August, 2016. The collection took place outdoors at Spring Valley (Figure 1).



Figure 1 – The outdoor setup at Spring Valley

### 2.2.1 MEASURED ITEMS

In addition to a large ISO40 collected to correct a mistake made at Blossom Point a couple of weeks earlier, two uncommon items were also measured: a simulated MK II Livens projectile (Figure 2); and a MK IV fuze booster (Figure 3).



Figure 2 – A simulated MK II Livens projectile



Figure 3 – A MK IV fuze booster

### 2.3 DATA COLLECTION PROCEDURES

The data collection procedures and guidelines are fully outlined in the SOP (Appendix C). This starts with an initial system check (section 3.2), followed by the system calibration check (section 3.3) and a few other steps (section 3.4) before getting into the data collection activities (sections 3.5-3.7). All inversions of library quality data collected over each munitions item as stipulated by the steps of section 3.6C of the SOP were held to MQO 4 of section 4 of the SOP.

### 2.4 DATA PRODUCTS

As specified in MR-201424 FRv2, two separate HDF5 file formats were ultimately settled upon as the final data products for the project. HDF5 files are flexible enough to include a variety of data structures – including photos – making these ideal for keeping related things in one place. The two formats are the library munitions item HDF5 file and the library self-contained raw data HDF5 file. These are discussed in detail in the final report.